CUSTOMER NO.: 38107

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of A. MARTIN	)	Examiner: T. McEVOY
Serial No.: 10/542,975	)	Art Unit: 3731
Filed: July 21, 2005	)	Confirmation: 1970
For: **MAGNETIC RESONANCE COMPATIBLE STENT**	)	
Date of Last Office Action: June 25, 2009	)	
Attorney Docket No.: PHUS030017US2/ PKRZ 2 01366	)	Cleveland, OH 44114 November 19, 2009

APPEAL BRIEF

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an Appeal from the Final Rejection of June 25, 2009.

A Notice of Appeal and fee were filed September 25, 2009.

The Appeal Brief submission fee is being submitted herewith.

CERTIFICATE OF ELECTRONIC TRANSMISSION

I certify that this Appeal Brief and accompanying documents in connection with U.S. Serial No. 10/215,713 are being filed on the date indicated below by electronic transmission with the United States Patent and Trademark Office via the electronic filing system (EFS-Web).

Nov 19 2009
Date

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(i) REAL PARTY IN INTEREST

The Real Party in Interest is the Assignee, KONINKLIJKE PHILIPS ELECTRONICS, N.V.

(ii) RELATED APPEALS AND INTERFERENCES

None

(iii) STATUS OF CLAIMS

Claims 13, 16, and 19-21 are pending in this application.

Claims 1-12, 14-15, and 17-18 have been cancelled.

Claim 13 stands rejected under 35 U.S.C. § 103 as being obvious over Pacetti (US 2002/0188345) taken alone.

Claims 16, 19, and 20 stand rejected under 35 U.S.C. § 103 as being obvious over Pacetti in view of Lau (US 6,066,168).

Claim 21 stands rejected under 35 U.S.C. § 112, first paragraph, as lacking enablement.

Claim 13 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Amendment D accompanies this Appeal Brief which corrects the wording inconsistency which led to the indefiniteness rejection. With this entry of Amendment D, it is submitted that the 35 U.S.C. § 112, second paragraph issues have been resolved.

Claims 13, 16, and 19-21 are being appealed.

(iv) STATUS OF AMENDMENTS

Amendment D is being filed with this Appeal Brief to resolve the 35 U.S.C. § 112, second paragraph issue. Because this Amendment reduces the issues on Appeal and raises no issues that would require further search or consideration, it is believed that this amendment will be entered.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

13. A magnetic resonance compatible stent **{50}** for use in intravascular therapy **{p. 1, l. 7-9; p. 2, l. 4, 9-10}**, the stent comprising:

a plurality of electrically conductive elements **{90}** arranged in a generally tubular structure, the conductive elements comprising generally diagonally arranged struts **{90}** with respect to a central axis **{60}** of the stent **{p. 7, l. 2 – p. 8, l. 4; Figs 2-4B}**, the conductive elements comprising:

a plurality of loops **{s1, s2, s3, s4; 110}** disposed about a central axis of the stent **{p. 8, l. 25-30; Figs 2-4B}**; and

a plurality of linking members **{90, B-B, A, 120}** for joining the loops such that the loops and linking members form a generally tubular structure around the central axis of the stent **{p. 8, l. 25 – p. 9, l. 2; p. 9, l. 17-20; p. 10, l. 3-9; Figs 2-4B}**; and

a plurality of non-conductive connector nodes **{95}** disposed among the conductive elements **{90}** for directing a current induced by RF signals in an examination region of a magnetic resonance apparatus to flow in the conductive elements such that adjacent segment currents cancel each other and a net current flowing in the stent is substantially minimized **{p. 8, l. 25 – p. 9, l. 2; p. 9, l. 18-20; p. 10, l. 3-9; Figs 2, 3A 4B}**;

wherein the loops and linking members are connected within the ~~insulator~~ non-conductive connector nodes such that the current flowing through adjacent loops substantially cancel each other **{p. 8, l. 28-30}**.

16. A stent **{50}** comprising:

a plurality of electrically conductive struts **{90}** connected by a plurality of insulating nodes **{95}** to define a diamond-shaped mesh of the conductive struts, the plurality of conductive struts and insulating nodes being disposed in a cylinder to define a generally tubular diamond-shaped conductive mesh, the conductive struts being electrically connected to define a plurality of loops **{s1, s2, s3, s4; 110}** of struts in a zig-zag pattern extending peripherally around the cylinder, each [[ring]] loop being electrically connected to each adjacent neighboring [[ring]] loop **{A, B-B, 120}** in such a manner that currents induced in the zig-zag loops during a

magnetic resonance examination flow in opposite peripheral directions and are substantially cancelled by one another **{p. 8, l. 9-22; p. 10, l. 3-9; Figs 2, 3A, 4B}**.

19. The stent according to claim 16, wherein each zig-zag loop **{s1, s2, s3, s4}** is connected **{A, B-B}** to each neighboring zig-zag loop only once. **{p. 8, l. 17 – p. 9, l. 22; Fig 2, 3A}**

20. The stent according to claim 16, wherein each zig-zag loop **{110}** is connected to its neighboring zig-zag loop alternately at 90° intervals. **{p. 10, l. 3-9}**

21. A stent **{50}** which inhibits interaction with an MR system **{p. 10, l. 10-11}**, the stent comprising:

two conductive expandable mesh layers with an elastic layer of non-conductive material in between, each mesh layer including a plurality of electrically conductive elements connected to define a conductive pattern along which currents induced by the MR system flow, the conductive patterns of the two conductive mesh layers overlaying each other and being configured such that the current induced in one of the conductive patterns is equal and opposite such that the currents cancel each other. **{p. 10, l. 10-18}**

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claim 13 distinguishes patentably and unobviously, in the sense of 35 U.S.C. § 103 over Pacetti taken alone.

Whether claims 16, 19, and 20 distinguish patentably and unobviously, in the sense of 35 U.S.C. § 103 over Pacetti as modified by Lau.

Whether the specification provides an enabling disclosure of the embodiment disclosed on page 10, lines 10-18 and of claim 21, which is specific to this embodiment.

With the entry of Amendment D which accompanies this Appeal Brief, the issue of whether claim 13 meets the requirements of 35 U.S.C. § 112, second paragraph, need not be reviewed on appeal.

(vii) ARGUMENT

A. Claim 13 is Patentable over Pacetti

First, it is submitted that Pacetti does not place the invention of claim 13 in the possession of the reader because it does not provide an enabling disclosure pursuant to the standard for an enabling disclosure applied by the Examiner against claim 21 (which the applicant does not concede is correct) of the combination of elements set forth in claim 13.

Although the present application and Pacetti both address the Faraday Cage effect, they do so in different ways using different scientific principles. In the present application, note Figure 3B, the applicant connects the conductive rungs 90 into loops which are interconnected such that current flows through the loops and the current in adjoining loops flows in the opposite direction. Note that current i1 and i2 flow in opposite directions; current i2 and current i3 flow in opposite directions; and current i3 and i4 flow in opposite directions. These equal and opposite currents produce cancelling magnetic fields and results in a zero net current. That is, in the present application, there are distinct flowing currents, but their current paths are arranged such that the currents are equal and opposite resulting in zero net current flow.

By contrast, as shown in Figure 5 of Pacetti, Pacetti interposes breaks 52 in such a manner that there are no electrically conductive loops. Rings 40 are cut by one or more discontinuities 52. Similarly, each cell 44 of region or conductive material surrounding each aperture 42 also includes a discontinuity 52 such that connectors 50 and the portions of the two rings which they connect do not form an electrically conductive loop. Due to this judicious placement of the discontinuities 52, Pacetti does not form continuous current loops which would support a current flow. Rather, Pacetti defines a plurality of open circuits. Rather than the concept of current loops which substantially cancel each other, Pacetti uses discontinuities such that there are no loop currents, i.e., works on a different principle.

Moreover, Pacetti teaches against the combination of claim 13. In paragraph [0033], Pacetti indicates that current flow around the entire perimeter or circumference of a stent are problematic. Any such current flows around the circumference of the stent through rings 40 Pacetti says are most problematic,

although current loops in cells 44 can also cause signal distortion or attenuation. In paragraph [0011], Pacetti states that "to eliminate or reduce the Faraday Cage effect, one approach is to break up the continuous metallic, electrically conductive paths in the stent pattern". Accordingly, it is submitted that Pacetti teaches that one should not have current loops. That is, Pacetti teaches against current loops, even equal and opposite current loops, in favor of discontinuities 52.

Claim 13 calls for a plurality of loops and for the loops and linking members to be connected such that the current flowing through adjacent loops substantially cancel each other. First, Pacetti teaches against current loops.

Second, Pacetti makes no suggestion of currents which substantially cancel each other.

Third, it is submitted that Pacetti does not disclose any and all possible configurations of stents which would address Faraday Cage effects. Paragraphs [0034]-[0035] do not disclose or fairly suggest all designs. Indeed, the "matter of choice" set forth in column 1, line 9 of page 4 (in [0037]) is referring to the cylindrical shape and not to conductive patterns in the stent.

Paragraph [0035] again teaches against arranging loops such that they have a current flow, but which current flow is in opposite directions such that the net current zeros cancel in favor of eliminating a complete electrically conducting circuit. In the middle of page 4 of the Office Action, the Examiner acknowledges that Pacetti teaches avoiding electrical loops or cells in paragraphs [0034]-[0035]. Accordingly, it is submitted that there is no teaching in and that, to the contrary, it is against the fair teachings of Pacetti to deliberately prevent current loops in the stent as set forth in claim 13.

Fourth, the "possible arrangement" suggested by the Examiner at the end of paragraph 7 is, it is submitted, derived from the present application and not fairly derived from Pacetti. Pacetti does not disclose current loops. Rather, in paragraph [0035] Pacetti asserts that current loops should be avoided. Moreover, the drawing at the end of paragraph 7 not only is not shown by or suggested in Pacetti, it is an open circuit and, as such, would not support the illustrated current flows.

B. Claims 16, 19, and 20 Distinguish Patentably Over the References of Record

First, the mesh of Lau and Pacetti are essentially the same, except that as Pacetti expands, edges of the apertures are zig-zagged with sharp or chevron-shaped points and edges of the apertures of Lau are undulating with rounded or S-shaped curves. Figures 4 and 5 of Pacetti have out-of-phase connectors 50 like Figures 5 and 11 of Lau. Similarly, the Examiner points to Lau, and asserts that Lau renders it obvious for the connectors to connect between only peaks or valleys. However, Lau has the same interconnector pattern as Pacetti. It is unclear what the Examiner is trying to achieve by combining Lau with Pacetti to show structures which are already in Pacetti.

Neither Pacetti nor Lau disclose a diamond-shaped mesh. As shown in Figures 2 and 3 of Lau, the stents of Lau (and Pacetti) are only expanded to the extent necessary to perform their intended function. They are not expanded full out. It is submitted that changing the chevron-shaped conductive elements between the conductors 50 of Pacetti to double-S-shaped conductive elements would not produce a diamond-shaped mesh but, rather, would produce a mesh of the shape illustrated in Figures 2 and 3 of Lau.

Claim 16 calls for the struts in the zig-zag pattern to extend around the cylinder and for currents to flow in such loops. Moreover, such loops are required to be interconnected such that the current flows through neighboring loops peripherally in opposite directions. By contrast, in Pacetti, there are no current supporting loops. Rather, Pacetti requires discontinuities 52 which block current flow in cylindrical rings 40 and around cells 44. Thus, rather than creating loops which carry current in opposite directions, Pacetti teaches against such a construction in favor of discontinuities which create open circuits and prevent current flow. Pacetti fails to suggest directing current in opposite directions through neighboring loops or rings. Lau fails to cure this shortcoming of Pacetti. Accordingly, it is submitted that claim 16 distinguishes patentably and unobviously over the references of record.

C. Claim 19 Distinguishes Patentably Over the References of Record

Claim 19 calls for each zig-zag loop to be connected to each neighboring zig-zag loop only once. This finds antecedent basis in Figure 3A and Figure 3B in the connection between loops s1 and s2 at B, the connection between loops s2 and s3 only at point A, the connection between loops s3 and s4 only at point B, etc. By contrast, in Pacetti, there are multiple connectors 50 between each adjacent loop. Lau does not cure this shortcoming of Pacetti. Like Pacetti, Lau has numerous connectors 13 between adjacent loops. The Examiner's discussion of Lau having connectors between only peaks or valleys is understood to be directed at claim 19, but its significance is not understood. Having connectors 13 only at peaks or valleys provides multiple connections between neighboring loops and does not connect each loop only once.

D. Claim 20 Distinguishes Patentably Over the References of Record

Claim 20 calls for connecting each zig-zag loop to its neighboring loop at 90° intervals. This finds antecedent basis in Figure 4B of the present application. The Examiner acknowledges that claim 20 is not met by Pacetti and refers the applicant to Figure 8 of Lau as curing this shortcoming. Figure 8 of Lau does not have connectors at 90° intervals. The connectors 13 of Figure 8 of Lau are at 360° intervals.

E. Claim 21 is in Condition For Allowance

The Examiner asserts that claim 21 fails to comply with the enablement requirement, but in paragraph 2 of the Office Action, finds the present application sufficiently enabling that he proposes a specific embodiment. The applicants submit that while the Examiner may propose one embodiment, there is a much simpler embodiment. For example, looking to Figures 3A and 3B of the present application, the undersigned would place the structure of Figure 3A in the first layer, cover it with the insulating material, and place the self-same structure of Figure 3A on top of the insulating material, but shifted by one loop. In this manner, current i1 of one layer would overlay current i2 of the next layer, etc. Another simple structure that would come within the scope of claim 21 can be had by merely folding the

structure of Figure 3B to put the loops in inner and outer planes and inserting the insulating material between the inner and outer loops. For example, loop s2 could be folded to overlay loop s1 with s3 folded to overlay s4, etc.

It is submitted that overlying current carriers in which the current is flowing in opposite directions is such a straightforward application of the principles of electrical engineering that it can be easily achieved by anyone of ordinary skill in the art. Accordingly, it is submitted that claim 21 meets the requirements of 35 U.S.C. § 112, first paragraph.

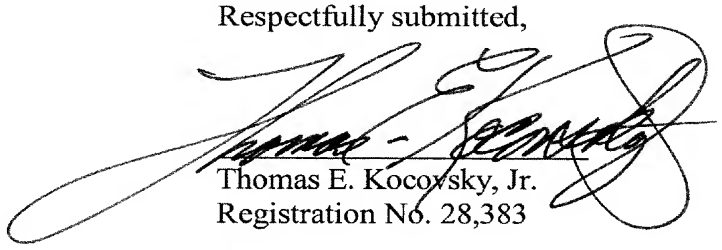
The Board is also invited to compare the Examiner's standard for enablement relative in the course of the 35 U.S.C. § 103 rejections to claims 13, 16, 19, and 20 above, in which he finds Pacetti, which specifically teaches interruptions such that there are no current carrying loops, is enabling to provide embodiments with continuous current flow through loops and moreover with current flow in opposite directions in neighboring loops. It is submitted that the standards for that which is enabling in a reference against claims should be the same as the standard for that which is enabling for claims.

There being no references applied against claim 21, it is submitted that claim 21 is patentable over the references of record.

(viii) CONCLUSION

For the reasons set forth above, it is submitted that claims 13, 16, and 19-21 distinguish patentably over the references of record and meet the other statutory requirements. An early reversal of the Examiner's rejections is requested.

Respectfully submitted,



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(ix) CLAIMS APPENDIX (with Amendment D entered)

13. (Rejected) A magnetic resonance compatible stent for use in intravascular therapy, the stent comprising:

a plurality of electrically conductive elements arranged in a generally tubular structure, the conductive elements comprising generally diagonally arranged struts with respect to a central axis of the stent, the conductive elements comprising:

a plurality of loops disposed about a central axis of the stent; and

a plurality of linking members for joining the loops such that the loops and linking members form a generally tubular structure around the central axis of the stent; and

a plurality of non-conductive connector nodes disposed among the conductive elements for directing a current induced by RF signals in an examination region of a magnetic resonance apparatus to flow in the conductive elements such that adjacent segment currents cancel each other and a net current flowing in the stent is substantially minimized;

wherein the loops and linking members are connected within the non-conductive connector nodes such that the current flowing through adjacent loops substantially cancel each other.

16. (Rejected) A stent comprising:

a plurality of electrically conductive struts connected by a plurality of insulating nodes to define a diamond-shaped mesh of the conductive struts, the plurality of conductive struts and insulating nodes being disposed in a cylinder to define a generally tubular diamond-shaped conductive mesh, the conductive struts being electrically connected to define a plurality of loops of struts in a zig-zag pattern extending peripherally around the cylinder, each loop being electrically connected to each adjacent neighboring loop in such a manner that currents induced in the zig-zag loops during a magnetic resonance examination flow in opposite peripheral directions and are substantially cancelled by one another.

19. (Rejected) The stent according to claim 16, wherein each zig-zag loop is connected to each neighboring zig-zag loop only once.

20. (Rejected) The stent according to claim 16, wherein each zig-zag loop is connected to its neighboring zig-zag loop alternately at 90° intervals.

21. (Rejected) A stent which inhibits interaction with an MR system, the stent comprising:

two conductive expandable mesh layers with an elastic layer of non-conductive material in between, each mesh layer including a plurality of electrically conductive elements connected to define a conductive pattern along which currents induced by the MR system flow, the conductive patterns of the two conductive mesh layers overlaying each other and being configured such that the current induced in one of the conductive patterns is equal and opposite such that the currents cancel each other.

(x) EVIDENCE APPENDIX

None

(xi) RELATED PROCEEDINGS APPENDIX

None